The second part, which will be of still greater consequence to naturalists will be a universal index to the first part and to the previous nomenclators and will contain altogether about 80,000 references. We shall thus shortly have, it is to be hoped, a most useful general work upon this important though technical subject brought up nearly to the present date.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

"Weather Forecasts"

HAD the Bishop of Carlisle, in his letter in NATURE (vol. xxvii. p. 4), instead of extracting from the *Times* a description of some results of the storm of October 24 last, quoted the statements as to the passage of this storm, issued in the reports of the Meteorological Office on October 24 and 25, his query concerning the failure of the weather forecasts would scarcely have needed reply.

A system of six pickets is established on our extreme western coasts, along a line which may be roughly regarded as describing the third of a circle, from Stornoway in the north-west, to Brest in the south-west. The enemy whose movements these outposts are to watch, pours in upon us a series of attacks in the form of cyclonic disturbances, by which the weather experienced in our islands is affected on 63 per cent. of our days. These circulations vary indefinitely in intensity. This element, and also their size, figure, direction, and velocity of propagation, are in great measure dependent on the distributions of atmospheric pressures and temperatures over a larger area than that occupied by our network of telegraphic stations. It will be enough to mention here that the velocity of advance of the cyclonic centres, as also of the front arcs of those exterior isobars which form closed curves, varies from zero to about 70 English miles per hour. In stormy periods like the present, the number and variability of the cyclonic circulations which attack us is extremely great, more than one per diem passing over some part of the British Isles. Now let it be remembered that our pickets sleep through the night, or that however wakeful they may be, they have, during the night hours, no means of communication with their commanding officers. How often a phalanx of the enemy will pass these outposts so as to occupy a position fairly within our area at 8 a.m., no instrumental indications having been given at 6 p.m. of the previous day—this, if treated as a question of probabilities, may be left to the Bishop of Carlisle. It is certainly obvious that such an advance, instead of being "very strange," *must* at times occur, if there be no miraculous interference in behalf of the Meteorological Office. At 8 a.m. on October 24, the centre of the disturbance referred to lay over Dorset, and was then moving to north-east at the rate of thirty-five miles per hour. Supposing the direction and velocity to have been uniform, the position occupied by the centre at 6 p.m. on the 23rd would have been about 180 miles north of Cape Finisterre, and, supposing the extent of the storm to have been also uniform, our outposts at that hour could have received no instrumental indication of the storm's progress, of a character distinct enough to justify the Meteorological Office in the issue of warnings. As a matter of fact the 6 p.m. observations telegraphed to the Office on the 23rd did show, as I think, no indications whatever of the existence of the storm.

It is obvious that the extreme velocity of the propagation of some of our severest storms is the element that especially renders it *possible* "that a storm of the first magnitude" may "come upon us unawares." As a matter of fact, the velocity of propagation on October 24 was considerably above the average. But if we refer to the charts for March 12 and 13, 1876, we find, at 8 a.m. on the former morning, a cyclone-centre occupying the precise position of that of the 24th ult., and that this disturbance moved to east-north-east with a mean velocity of 62·5 miles per hour.

There is a further risk, against which our system of telegraphy cannot protect us, viz., that of a storm centre being primarily developed within our area of observation during the hours when there is no telegraphic communication, and storms in their first stage of development are often the most dangerously rapid and intense. The telegraphic observations transmitted at 6 p.m. on October 23 and at 8 a.m. on October 24, afford no materials for deciding whether this may not have been the case in the instance under consideration, although this question can be decided from data since received. On the whole, to the minds of many students of the subject it will appear rather "strange" that the Office, *with the materials at its disposal*, does not more often fail to furnish satisfactory warnings of the more serious of our gales. It is easy to say, in view of occasional failures, "the system itself must be at fault:" it is still easier to reply, "better it!" If the country cares enough for the welfare of "fishermen and others" to do so, let it provide the necessary funds for a system of night telegrams, and if possible for a series of oceanic stations. If it does not, it must be content with things as they are.

I have been careful to speak of instrumental observations only. It is already well known that observations of the movements of the higher clouds commonly give indications of the position and advance of distant cyclonic systems. But it has hitherto been found impossible to train our observers in the difficult art of taking these observations. To the accomplishment of this task, which would greatly add to the utility of our weather-forecasts, some of us are now devoting ourselves with every prospect of success. W. CLEMENT LEY

Ashby Parva, Lutterworth, November 3

P.S.—Since the above was sent to press a storm-centre has crossed Scotland with a velocity of about 45 miles per hour. Indications of its progress were however afforded by cloud observations at a distance of more than 800 miles in advance of the centre, the velocity of propagation being supposed uniform.—W. C. L.

The Comet

YOUR engraver has missed what I thought the most important feature in the drawings which I made of the comet on the 21st inst., viz. the *shadow* beyond the end of the tail, of the length of 3 or 4 degrees, very obviously darker than the surrounding space, in which it was lost, without demarcation. This was expressed in my sketch by a shade of lampblack, very slight, to avoid exaggeration, and perhaps just sufficient to escape the engraver's notice. The comet, as seen this morning, is diminished much in size, and still more in brightness, and the present moonlight much impairs its beauty and distinctness.

C. J. B. WILLIAMS

Villa du Rocher, Cannes, France, October 30

NOTICING Major J. Herschel's remark in NATURE, vol. xxvii. p. 5, as to the difficulty he experienced in London of observing the comet, apparently owing to the moonlight, I may state that on the morning of the same Sunday to which he refers, I saw the comet very plainly when at Rothsay, Isle of Bute, Scotland. The time was between 5 and 6 a.m., and therefore before sunrise. The moon was brilliant, and the whole sky wonderfully clear, and but few stars noticeable, on account of the moonlight, nevertheless, the comet showed well, extending about 20° across the sky due south, magnetic; the nucleus was well defined, and about as bright as the stars then visible. The tail was straight, spreading outwards to the extremity. No glass was used in the observation recorded. W. J. MILLER

Glasgow, November 3

IT might be interesting to some of the readers of your paper to know that this morning, at 5 a.m., Mr. Manning, the agent here for Messrs. F. and A. Swanzy, merchants, and myself, saw a very fine comet bearing south-east, and the tail of which was as long as my first finger, from tip to last joint; its head, bearing a little to the east, was pointing into the sea, and was about the height from the sea of my four fingers held at arm's length; it was very brilliant, and we seem to have seen it to great advantage. Unfortunately we had only a field glass to view it through, and being also without instruments, were unable to take its proper altitude or bearings. We were standing on the verandah of the house at the time, which is on the beach, and about forty feet above the level of the sea.

We should be glad to know if the comet has been seen further

north by anyone else. Quitta is situated 5° N. latitude, and 1° E. longitude.

WALTER HIGGINSON
B. MANNING

Quitta, West Coast Africa, September 25

Two Kinds of Stamens with Different Functions in the same Flower

IT may be worth mentioning that cases strongly analogous to those described in NATURE (vol. xxiv. p. 307, and vol. xxvi. p. 386, are also to be observed among the Monocotyledons in the family of Commelynaceæ, and that these cases offer some graduations.

In *Tradescantia virginica*, L., the flowers, as is generally known, are turned upwards and quite regular, the leafy organs of each whorl (3 sepals, 3 petals, 3 outer, 3 inner stamens, 3 united carpels) being alike and equal in size. As Delpino has clearly shown (*Ulteriori osservazioni*, parte ii. fascic. 2, p. 297) these flowers are adapted to Apidæ, which in order to collect pollen take hold of the articulated hairs of the filaments. In some other species here to be considered the adaptation to pollen-collecting bees has remained, but the flowers have turned laterally, and thus not only has their form become irregular (bi-laterally symmetrical or zygomorphous), but also the function of the stamens has gradually changed.

In *Tinnantia undata*, Schlecht. (Fig. 1), sepals and petals are still almost unaltered in form and size, only stamens and pistil have become markedly irregular. The broad roundish petals, which are light purple, spread in a perpendicular plane. The 3 upper stamens, with shorter filaments projecting from

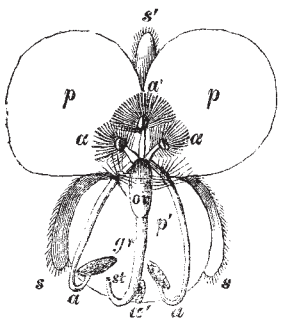

FIG. 1.

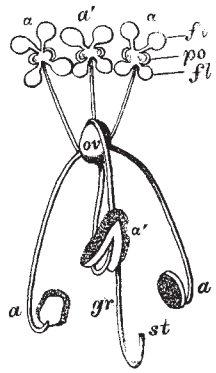

FIG. 2.

FIG. 1.—Front view of the flower of *Tinnantia undata*, Schlecht. FIG. 2.—Front view of the androecium and gynæcium of *Commelyna cœlestis*, Willd. *s*, *s*, *s'*, sepals; *p*, *p*, *p'* petals; *a*, *a*, *a'*, outer whorl of anthers; *a*, *a*, *a'*, inner whorl of anthers, or ovary; *gr*, style ("Gr.ffel"); *st*, stigma.

the middle of the flower, are highly conspicuous by a diverging tuft of bright yellow articulated hairs, which on the last third of the light-purple filaments surround the golden yellow anthers like a cone of golden rays. At the tips of these filaments golden yellow pollen-grains are presented by the whole front side of the three upper anthers.

The three lower stamens are much longer, directed obliquely downwards and forwards, with only their tips bending upwards, a little overtopped by the pistil, which has the same direction and incurvation. These parts, like the same parts in the described Melastomaceæ, will hardly be perceived by an advancing insect, "owing to their projection against the broad-petalled corolla of the same colour in the background," for not only the style and the filaments, but also the hairs on the base on the two lateral lower filaments are of the same purple colour as the petals, and even the bluish lower anthers with their yellowish pollen are but feebly conspicuous. Any one of the Apidæ or Syrphidæ of suitable size, however, when making for the upper yellow stamens in order to collect their pollen (I have only once observed the honey-bee doing so), will involuntarily repose on the projecting parts, and at first bring the stigma and then the two lateral of the lower anthers into contact with the under-side of its abdomen, and thus regularly effect cross fertilisation.

Here, then, as in Heeria, &c., the anthers have differentiated into upper ones, which attract insects and afford food to them, and lower ones which attach their pollen to the visitors, and cause it to be transported by them to the stigma of the next visited flowers. Also differentiation in the pollen of the two kinds of anthers in our Tinnantia has begun to take place, but contrary to Melastoma, the pollen-grains of the short stamens here are smaller than those of the longer ones. I measured numerous pollen-grains of two individuals in a moistened state (where they are of elliptical form), and found in the one stem the pollen-grains of the short stamens (in 1-1000 m.m.) 62-75 long, 31-38 broad, those of the longer ones 68-94 long, 38-44 broad; in the other stem, those of the short stamens 53-69 long, 28-37 broad; those of the longer ones 59-78 long, 31-40 broad. Both kinds of pollen proved to be quite fertile.

Commelyna cœlestis, Willd. (Fig. 2) possesses in general the same contrivances for cross-fertilisation, but has gone a step further in differentiation. Its upper sepal is plainly smaller, its lower petal plainly larger than the two other ones; its upper anthers (*a*, *a'* *a*) have differentiated in themselves; two small lateral portions of each of them (*po*) produce a little pollen and four cross-like diverging flaps (*fl*), which are much larger, attract insects by their bright yellow colour strikingly contrasting with the azure corolla, and perhaps at the same time serve as food to the visitors. The articulated hairs of the filaments thus having lost not only their original function (which they have in all stamens of Tradescantia) as supports for the feet of pollen-collecting bees, but also their secondary function (which they have in the upper stamens of Tinnantia) of attracting insects, have disappeared altogether. The middlemost of the lower anthers, which in Tinnantia is nearly useless from its position behind the style here, has erected and become much larger than the two lateral ones, so as to be eminently useful.

The pollen-production of the upper anthers appears to be vanishing, not only from the diminution of the quantity of produced pollen, but also from the great variability of the size of the pollen grains. For whilst the pollen grains of the two lateral lower anthers only differ in length from 75 to 90, in breadth from 45 to 68, and those of the middlemost lower anther in length from 56 to 82, in breadth from 37 to 56, those of the three upper anthers fluctuate from 50 to 87 length, and from 31 to 56 breadth.

In *Commelyna communis*, differentiation has gone still further; the upper sepal and the lower petal are relatively very small; the upper filaments, like the upper petals, are blue-coloured; the lower filaments, like the pistil and the lower petal, are colourless. The upper anthers, as far as I have seen (without microscope) produce no more pollen

The examination of other species and genera of Commelynaceæ probably would show a longer scale of gradations.

Lippstadt, October 25 HERMANN MÜLLER

A Curious Halo

THERE appeared in NATURE, vol. xxvi. pp. 268, 293, two articles headed "A Curious Halo," which reminded me of an analogous and still more curious phenomenon occurring sometimes here in China, during the hot season. I beg to hand you a few lines on that subject, from the *Monthly Bulletin* of the Zi-ka-wei Observatory for August, 1877:—

"A phenomenon to which I wish to call the attention of meteorologists was observed many times during that month (August), as also in July. It does not seem to take place in Europe, and I am inclined to think that it cannot occur except with an atmosphere over-charged with aqueous vapour, as it is the case with us in July and August. In the evening, just after sunset, or in the morning even long before sunrise, no matter what the direction of the wind and the barometric pressure may be, provided the day or night were very warm, *bands* of a tint varying from the faintest to the deepest *blue* are seen to appear upon the whitish or roseate vault of heaven. They usually are first seen in the east at evening and in the west at morning time, seemingly radiating from a common centre diametrically opposite the sun's position. At other times they emerge from the very position of the sun, or from both points at once, the interval being either free from bands or completely encircled by them.

"Last year (1876), on the morning of September 4, I enjoyed a most interesting sight. It was about 5 a.m., the moon, then on her nineteenth day, was above the western horizon, and just being partially eclipsed; now from her bright disc, as from a radiating centre, shot out a number of those bands or blue beams; they traversed the whole expanse of the sky, and seemed to converge towards a point whose situation in the east